Amendments to Claims

1. (Currently Amended) A multi-layer substrate, comprising:
   a. a low glass transition temperature polyimide layer comprising a polyimide base polymer synthesized by contacting an aromatic dianhydride with a diamine component in a molar ratio of dianhydride to diamine from 0.9 to 1.1, the diamine component comprising about 50 to about 90 mole % aliphatic diamine and about 10 to about 50 mole % aromatic diamine, said polyimide base polymer having a glass transition temperature from about 150 to about 200°C;
   b. a high glass transition temperature polyimide layer ~~comprising a~~ having a glass transition temperature above the low glass transition temperature polyimide layer, wherein the difference in lamination temperature between the high glass transition temperature layer and the low glass transition temperature layer is in a range between and including 10 and 200°C; and
   c. a conductive layer,

wherein the low glass transition temperature polyimide layer has a z-axis coefficient of thermal expansion of less than 150 ppm/°C according to ASTM Method IPC-650 2.4.41, and

wherein the high glass transition temperature polyimide layer is between the conductive layer and the low glass transition polyimide layer.

2. (Original) A multi-layer substrate in accordance with Claim 1 further comprising a second low glass transition temperature polyimide layer located between the conductive layer and the high glass transition temperature polyimide layer.

3. (Canceled).

4. (Currently Amended) A multi-layer substrate in accordance with Claim 1, wherein~~: i.~~ the aliphatic diamine has the structural formula $H_2N\text{-}R_1\text{-}NH_2$, where R_1 is a substituted or unsubstituted hydrocarbon from C_4 to C_{16}.

5. (Original) A multi-layer substrate in accordance with Claim 1, wherein the aliphatic diamine has the structural formula $H_2N\text{-}R_2\text{-}NH_2$, where R_2 is a hydrocarbon from C_6 to C_8.

6. (Previously Presented) A multi-layer substrate in accordance with Claim 1, wherein the aliphatic diamine is selected from the group consisting of 1,4-tetramethylenediamine, 1,5-pentamethylenediamine (PMD), 1,7-heptamethylene diamine, 1,8-octamethylenediamine, 1,9-

nonamethylenediamine, 1,10-decamethylenediamine (DMD), 1,11-undecamethylenediamine, 1,12-dodecamethylenediamine (DDD), and 1,16-hexadecamethylenediamine.

7. (Previously Presented) A multi-layer substrate in accordance with Claim 1, wherein the aromatic diamine is selected from the group consisting of 1,2-bis-(4-aminophenoxy) benzene, 1,3-bis-(4-aminophenoxy) benzene, 1,2-bis-(3-aminophenoxy)benzene, 1,3-bis-(3-aminophenoxy) benzene, 1-(4-aminophenoxy)-3-(3-aminophenoxy) benzene, 1,4-bis-(4-aminophenoxy) benzene, 1,4-bis-(3-aminophenoxy) benzene, and (4-aminophenoxy)-4-(3-aminophenoxy) benzene, 2,2-bis-(4-[4-aminophenoxy]phenyl) propane (BAPP), and 2,5-dimethyl-1,4-phenylenediamine (DPX).

8. (Previously Presented) A multi-layer substrate in accordance with Claim 1, wherein the aromatic dianhydride is selected from the group consisting of 2,2',3,3'-benzophenone tetracarboxylic dianhydride, 2,3,3',4'-benzophenone tetracarboxylic dianhydride, 3,3',4,4'-benzophenone tetracarboxylic dianhydride (BTDA), 2,2',3,3'-biphenyl tetracarboxylic dianhydride, 2,3,3',4'-biphenyl tetracarboxylic dianhydride, 3,3',4,4'-biphenyl tetracarboxylic dianhydride (BPDA), 4,4'-oxydiphthalic anhydride (ODPA), 2,2-bis-(3,4-dicarboxyphenyl) 1,1,1,3,3,3,-hexafluoropropane dianhydride (6FDA), pyromellitic dianhydride (PMDA), and tetrahydrofuran tetracarboxylic dianhydride.

9. (Original) A multi-layer substrate in accordance with Claim 1, wherein the aliphatic diamine is hexamethylene diamine (HMD), wherein the aromatic diamine is 1,3-bis-(4-aminophenoxy) benzene, and wherein the aromatic dianhydride is a combination of 3,3',4,4'-benzophenone tetracarboxylic dianhydride (BTDA) and 3,3',4,4'-biphenyl tetracarboxylic dianhydride (BPDA).

10. (Original) A multi-layer substrate in accordance with Claim 1, wherein the aromatic dianhydride component is 70 to 95 mole % 3,3',4,4'-biphenyltetracarboxylic dianhydride (BPDA) and 5 to 30 mole % 3,3',4,4'-benzophenonetetracarboxylic dianhydride (BTDA), and wherein the diamine component is 60 to 80 mole % hexamethylene diamine (HMD) and 20 to 40 mole % 1,3-bis-(4-aminophenoxy) benzene (APB-134, RODA).

11. (Original) A multi-layer substrate in accordance with Claim 1, wherein a surface of the conductive layer is in direct contact with the high glass transition temperature polyimide layer.

12. (Original) A multi-layer substrate in accordance with Claim 9, wherein a surface of the low glass transition temperature polyimide layer is in direct contact with the high glass transition temperature polyimide layer.

13. (Original) A multi-layer substrate in accordance with Claim 1, further comprising one or more additional conductive layers.

14. (Deleted)

15. (Currently Amended) A multi-layer substrate in accordance with Claim 1, wherein the substrate is at least: i. a component of; or ii. a precursor to, a packaging composition, the packaging composition being a chip on lead ~~("COL")~~ package, a chip on flex ~~("COF")~~ package, a lead on chip ~~("LOC")~~ package, a multi-chip module ~~("MCM")~~ package, a ball grid array ~~("BGA" or "μ-BGA")~~ package, chip scale package ~~("CSP")~~, a tape automated bonding ~~("TAB")~~ package, or a package comprising a micro-via.

16. (Original) A multi-layer substrate in accordance with Claim 1, wherein the substrate is a component of a wafer level integrated circuit packaging comprising a conductive passageway, said conductive passageway being at least a portion of one or more members of the group consisting of: a wire bond, a conductive metal, and a solder bump.

17. (Original) A multi-layer substrate in accordance with Claim 1 further comprising a filler material selected from the group consisting of alumina, silica, boron nitride, silicon carbide, clay, diamond, dicalcium phosphate, aluminum nitride, titanium dioxide, polyaniline, polythiophene, polypyrrole, polyphenylenevinylene, polydialkylfluorenes, carbon black, and graphite.

18. (Deleted)

19. (Previously Presented) A sequential build-up (SBU) micro-via integrated circuit packaging substrate, consisting essentially of:

a) a first layer, the first layer comprising a low glass transition temperature polyimide layer comprising a polyimide base polymer synthesized by contacting an aromatic dianhydride with a diamine component in a molar ratio of dianhydride to diamine from 0.9 to 1.1, the diamine component comprising about 50 to about 90 mole % aliphatic diamine and about 10 to about 50 mole % aromatic diamine, said polyimide base polymer having a glass transition temperature from about 150 to about 200°C;

b) a second layer, the second layer comprising a high glass transition temperature polyimide layer having a glass transition temperature above the low glass transition temperature polyimide layer, wherein the difference in lamination temperature between the high glass transition temperature layer and the low glass transition temperature layer is in a range between and including 10 and 200°C; and

c) pre-drilled organic core material selected from the group consisting of BT-epoxy-glass core or FR-4 core having a plurality of laser induced microvias of 10-100 μm in diameter in the core material, the microvias comprising a copper interconnect;

wherein at least one surface of the core material is bonded to at least one surface of either the first layer or the second layer, said microvia extending from the core material into or through said first layer or said second layer.